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Aluminium

(IPA: /ˌæljʊˈmɪniəm/, /ˌæljəˈmɪniəm/) or aluminum (IPA: /əˈluːmɪnəm/, see the "spelling" section below) is a silvery and ductile member of the poor metal group of chemical elements. It has the symbol Al; its atomic number is 13.

Aluminium is the most abundant of all metals and the third most abundant element in the Earth's crust, after oxygen and silicon. It makes up about 8% by weight of the Earth's solid surface, Aluminum is too reactive chemically to occur in nature as the free metal. Instead, it is found combined in over 270 different minerals [1]. The chief source of aluminum is bauxite ore. Aluminum is remarkable for its ability to resist corrosion (due to the phenomenon of passivation) and its light weight. Structural components made from aluminium and its alloys are vital to the aerospace industry and very important in other areas of transportation and building.

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			<u> </u>									
13	magnesium ← aluminium → silicon											
B ↑ Al ↓ Ga	Al 13PE											
General												
Nam	e, sy	mbol, n	umber	alumi	aluminium, Al, 13							
Chen	nical	series		роог	boot wetaja							
Grou	p, pe	eriod, bl	ock	13, 3,	p							
Арре	aran	ice		silver	silvery							
Stand	lard	atomic	weight	26.98	26.9815386(8) g·mol ⁻¹							
Elect	Ton (configu	ration	[Ne]	[Ne] 3s ² 3p ¹							
Elect	rons	per she	11	2, 8,	2, 8, 3							
			Physics	al prop	erties							
Phas	e		•	solid	solid							
Dens	ity (near r.t.)	2.70	2.70 g·cm ⁻³							
Liqu	id de	nsity at	m.p.	2.375	2.375 g·cm ⁻³							
Melt	ing p	oint			933.47 K (660.32 °C, 1220.58 °F)							
Boili	ng p	oint			2792 K (2519 °C, 4566 °F)							
Heat	of fi	usion		10.71	10.71 kJ·mol ⁻¹							
Heat	of v	aporiza	ion	294.0	294.0 kJ·mol ⁻¹							
Heat	capa	acity	 	(25 %	(25 °C) 24,200 J·mol ⁻¹ ·K ⁻¹							
	Vapor pressure											
P/	Ра	1	10	100	1 k	10 k	100 k					
at 2	ľΚ	1482	1632	1817	2054	2364	2790					
			Atomi	c prope	erties							
Crys	tal st	ructure			face centered cubic 0.4032 nm							
Oxid	lation	states		3 (amp	3 (amphoteric oxide)							
Elec	trone	gativity	7	1.61	1.61 (Pauling scale)							
1												

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Properties

Aluminium is a soft, lightweight metal with appearance ranging from silvery to dull gray, depending on the surface roughness. Aluminium is nontoxic, nonmagnetic, and nonsparking. The yield strength of pure aluminium is 7–11 MPa, while aluminium alloys have yield strengths ranging from 200 MPa to 600 MPa.^[2] Aluminium has about one-third the density and stiffness of steel. It is ductile, and easily machined, cast, and extruded.

Corrosion resistance is excellent due to a thin surface layer of aluminium oxide that forms when the metal is exposed to air, effectively preventing further oxidation. The strongest aluminium alloys are less corrosion resistant due to galvanic reactions with alloyed copper.^[2]

Aluminium atoms are arranged in an FCC structure. Aluminium has a high stacking-fault energy of approximately 200 mJ/m². [3]

Aluminium is one of the few metals which retain full silvery reflectance in finely powdered form, making it an important component of silver paints. Aluminium mirror finish has the highest reflectance of any metal in the 200–400 nm (UV) and the 3000–10000 nm (far IR) regions, while in the 400–700 nm visible range it is slightly outdone by silver and in the 700–3000 (near IR) by silver, gold, and copper.

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	ion ener	gies	1st: 577.5 kJ·mol ⁻¹							
(more)	•		2nd: 1816.7 kJ·mol ⁻¹							
			3rd: 2744.8 kJ·mol ⁻¹							
Atomi	c radius		125 pm							
Atomi	c radius	(calc.)	118 pm							
Covale	nt radiu	9	118 pm							
Miscellaneous										
Magne	tic order	ring	paramagnetic							
Electri	cal resis	tivity	(20 °C) 26.50 na ·m							
Therm	al condu	ctivity	(300 K) 237 W·m ⁻¹ ·K ⁻¹							
Therm	al expan	sion	(25 °C) 23.1 μm·m ⁻¹ ·K ⁻¹							
Speed	of sound	d (thin rod)	(r.t.) (rolled) 5000 m·s ⁻¹							
Young	's modul	lus	70 GPa							
Shear	nodulus		26 GPa							
Bulk n	odulus		76 GPa .							
Poisso	o ratio	,	0.35							
Mohs l	pardness		2.75							
Vicker	s hardne	SS	167 MPa							
Brinell	parques	5 5 .	245 MPa							
CAS r	egistry n	umber	7429-90-5							
		Selecte	d i	sotopo	15					
	Main	article: Iso	to	pes of	aluminium					
iso	NA	half-life		DM	DE (MeV)	DP				
	syn			מ+	1.17	²⁶ Mg				
²⁶ A1		7.17×10 ⁵ y	,	-		²⁶ Mg				
		•		0	1.8086	• .				
²⁷ Al	100%	Al is stable with 14 neutrons								
- References										
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Aluminium is a good thermal and electrical conductor, by weight better than copper. Aluminium is capable of being a superconductor, with a superconducting critical temperature of 1.2 Kelvin.

Applications

General use

Whether measured in terms of quantity or value, the global use of aluminium exceeds that of any other metal except iron, and it is important in virtually all segments of the world economy.

Relatively pure aluminium is encountered only when corrosion resistance and/or workability is more

http://en.wikipedia.org/wiki/Aluminium

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